System Fundamentals

Enterprise Architecture

Case Study – Marriott International

Marriott International experienced a breach in mid-September 2018, which affected millions of guests.

Source: Freepik

Who can recollect what had happened?

Case Study – Marriott International

- Investigators began scouring the system for clues and discovered a Remote Access Trojan (RAT) along with MimiKatz, a tool for sniffing out username/password combos in system memory.
- The credit card number aspects are particularly worrying and were made possible by yet another security failing on Marriott's part: while the credit card numbers were stored in encrypted form, the encryption keys were stored on the same server, and were also apparently scooped up in the breach.
- As for the passport numbers, while some were encrypted, the majority were simply saved in the clear.

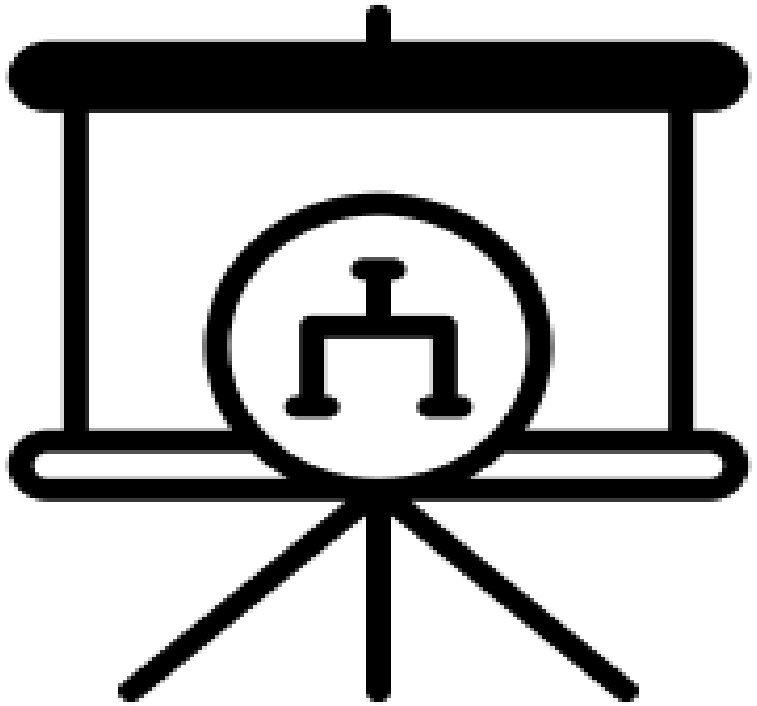
Source: Marriott

Source: https://www.csoonline.com/article/3441220/marriott-data-breach-faq-how-did-it-happen-and-what-was-the-impact.html

Case Study – Marriott International

- In late 2018, the Marriott hotel chain announced that one of its reservation systems had been compromised, with hundreds of millions of customer records, including credit card and passport numbers, being exfiltrated by the attackers

How do you think this would have happened?

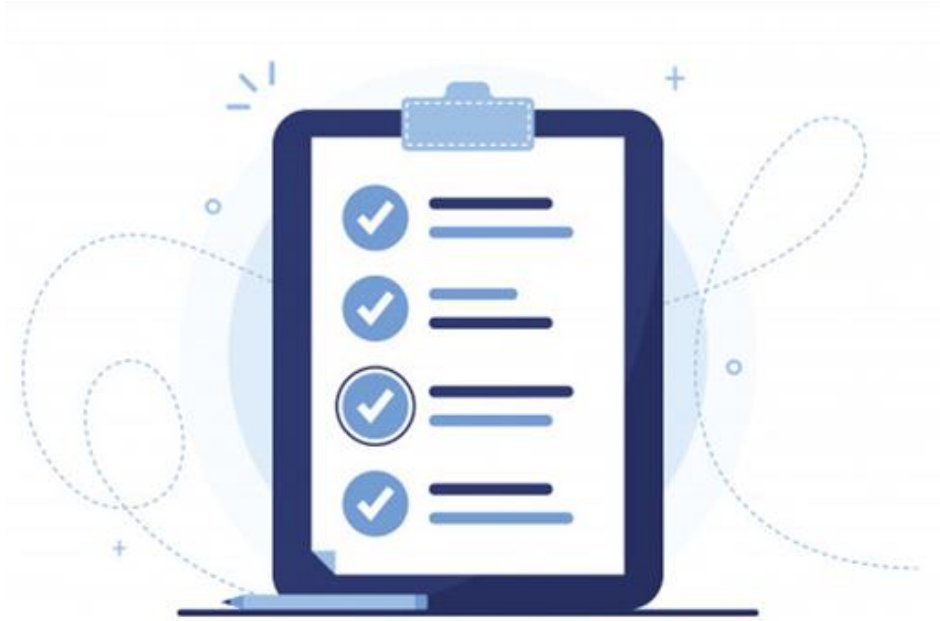


Source: https://www.csoonline.com/article/3441220/marriott-data-breach-faq-how-did-it-happen-and-what-was-the-impact.html

Agenda

In today's session, you will learn about:

- Digital Data and its types
- Information and Information System
- Data Centres, its Characteristics and Processes
- Evolution of Platforms
- Data Centre Infrastructure



Source: Freepik

What is Data?

- It is a collection of facts, typically collected for the purpose of analysis or reference

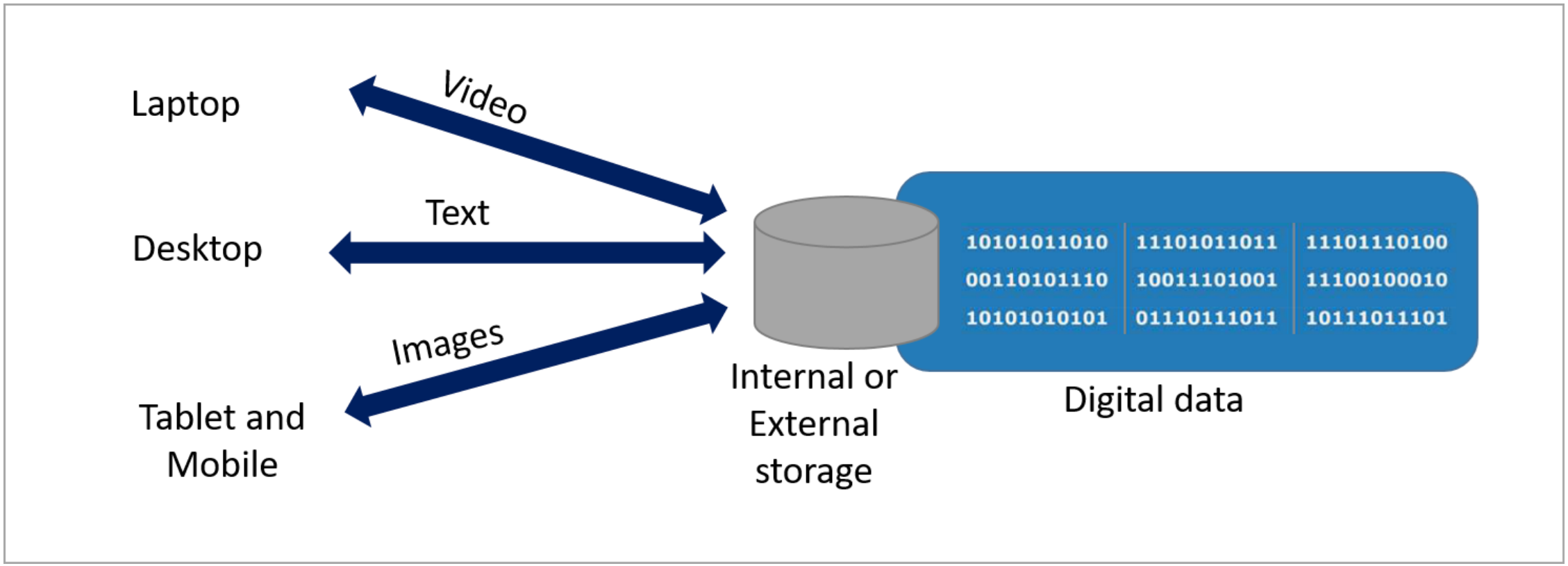
Source: Pixabay

What is Digital Data?

Source: Pixabay

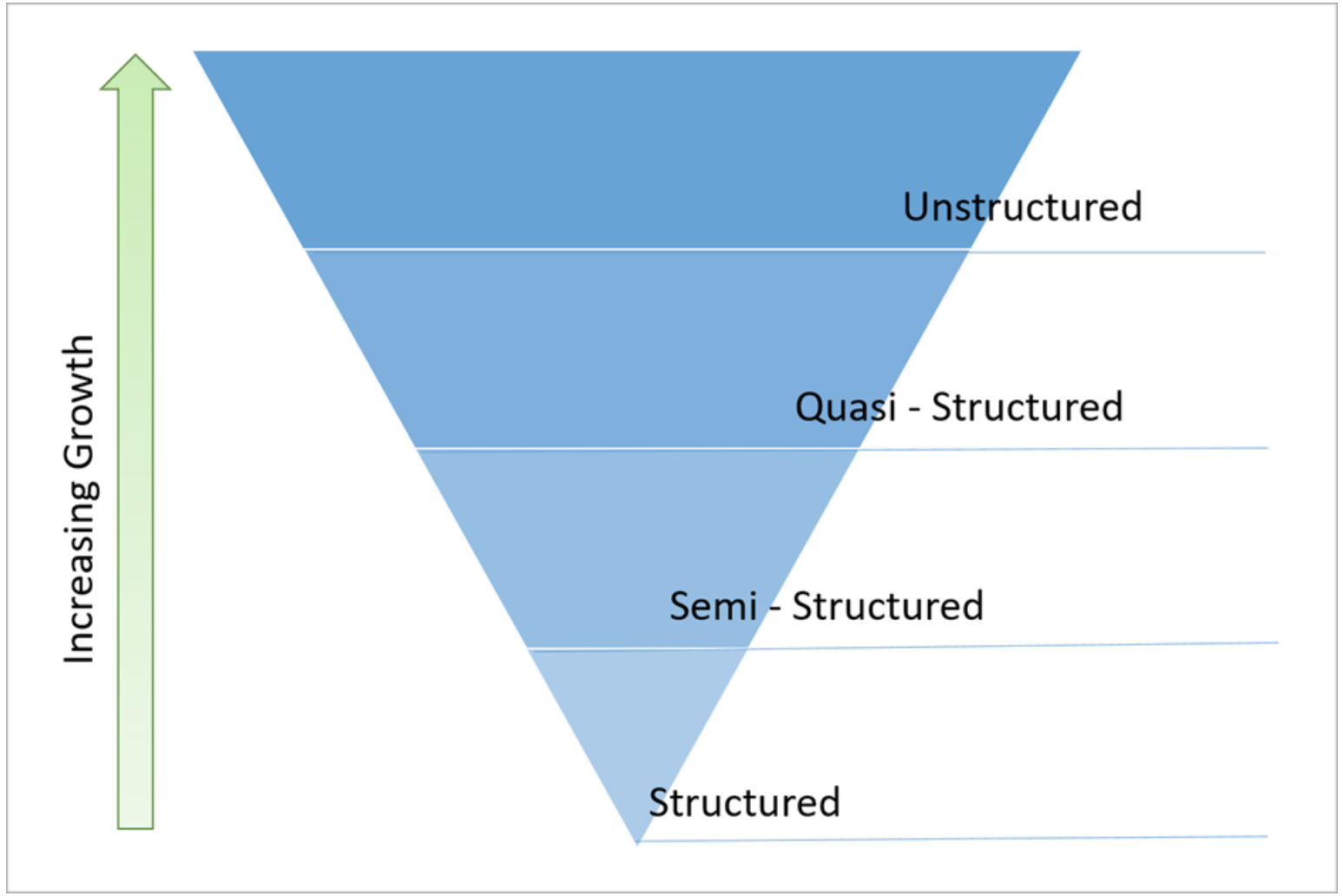
Digital Data

- Digital data is a collection of facts that is transmitted and stored in electronic form, and processed through software
- It is stored as strings of binary values (0s and 1s) on a storage medium



Types of Digital Data

- Digital data can be divided into:



Is Data and Information the same?

Source: Pixabay

What is Information?

- Processed and organized data is called information
- Information creates knowledge and enables decision-making
- Processing and analysing data is vital to any organization as it enables organizations to derive value from data, and create intelligence to enable decision-making and organizational effectiveness

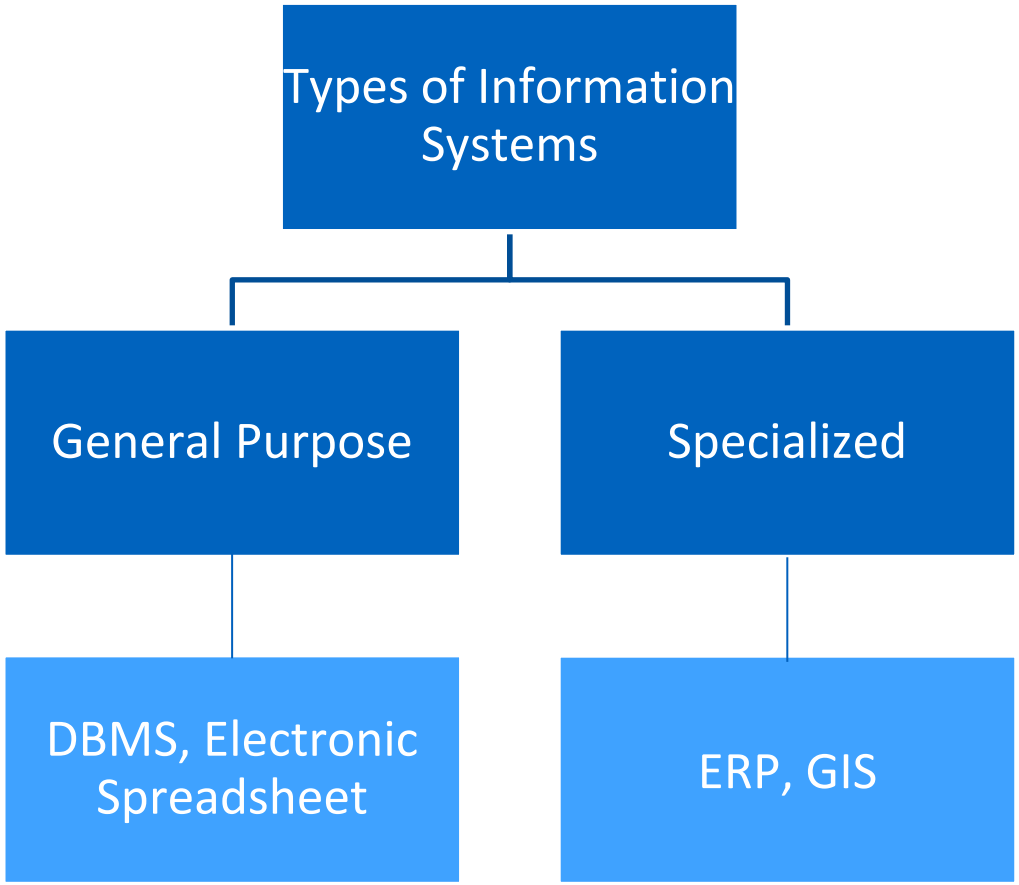
Source: Pixabay

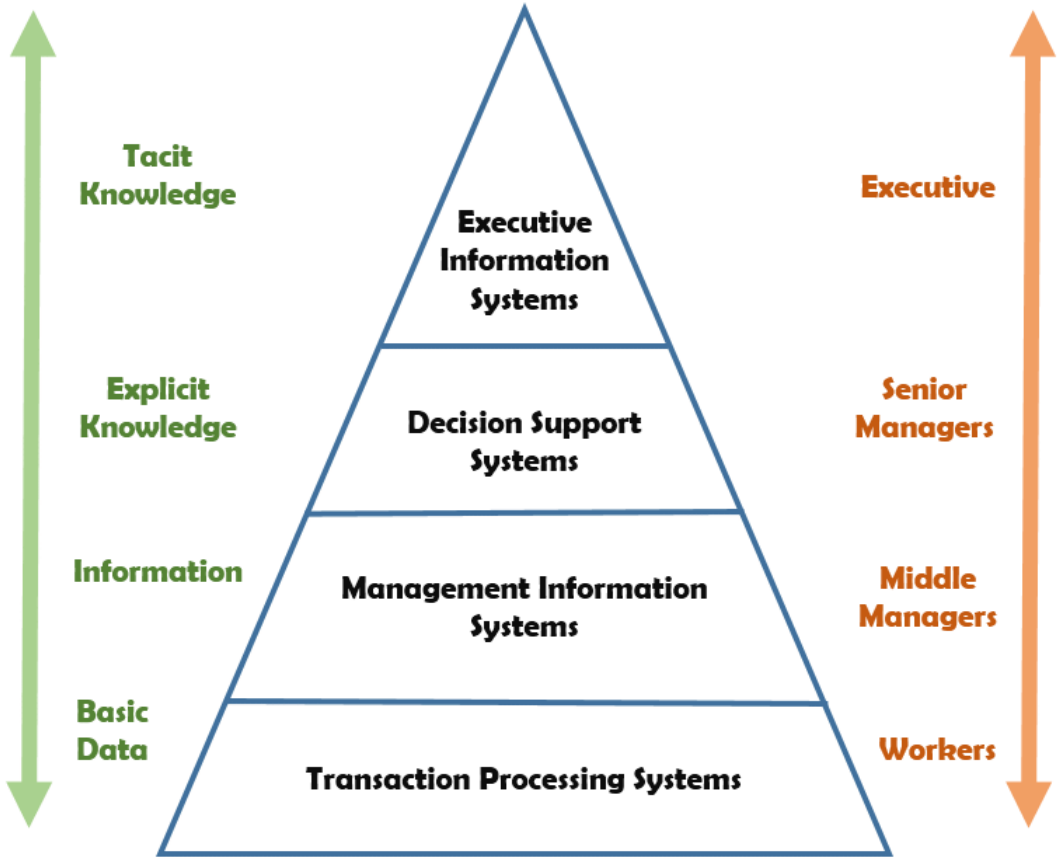
Information System

- The software that helps organize and analyze data
- The purpose of an information system is to turn raw data into useful information that can be used for decision making in an organization.

Source: Pixabay

Types of Information Systems





Source: Researchgate

Components of Information System

Components	Description
Hardware	Computer-based information systems use computer hardware, such as processors, monitors, keyboard and printers.
Software	These are the programs used to organize, process and analyze data.
Databases	Information systems work with data, organized into tables and files.
Network	Different elements need to be connected to each other, especially if many different people in an organization use the same information system.
Procedures	These describe how specific data are processed and analyzed in order to get the answers for which the information system is designed.

Name of the Activity

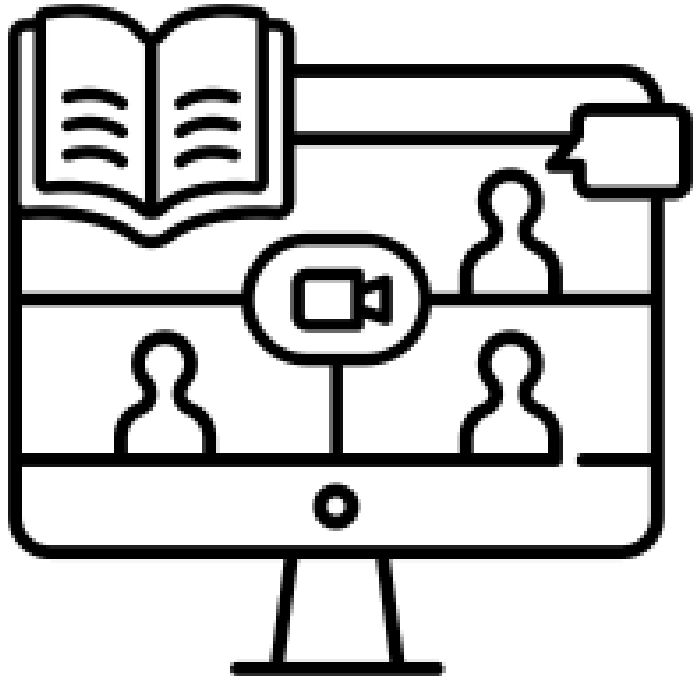
Fastest Finger First

Instructions

Mode: **In-session**

Duration: **5 minutes**

Materials Required: **None**



Activity – Fastest Finger First

1. Hardware
2. Software
3. Databases
4. Network
5. Procedures

a. Different elements need to be connected with each other
b. This includes processors, monitors, keyboard and printers
c. These describe how specific data are processed and analyzed
d. Information systems work with data, organized into tables and files
e. These are the programs used to organize, process and analyze data

1- b 2- e 3- d 4-a 5- c

Source: Pixabay

Management Information System

- A computer system consisting of hardware and software that serves as the backbone of an organization's operations

- The MIS collects the data, stores it, and makes it accessible to managers who want to analyze the data by running reports.

- An organization needs an MIS because:
  - Aids decision making
  - Facilitates communication
  - Keeps record

Name of the Activity

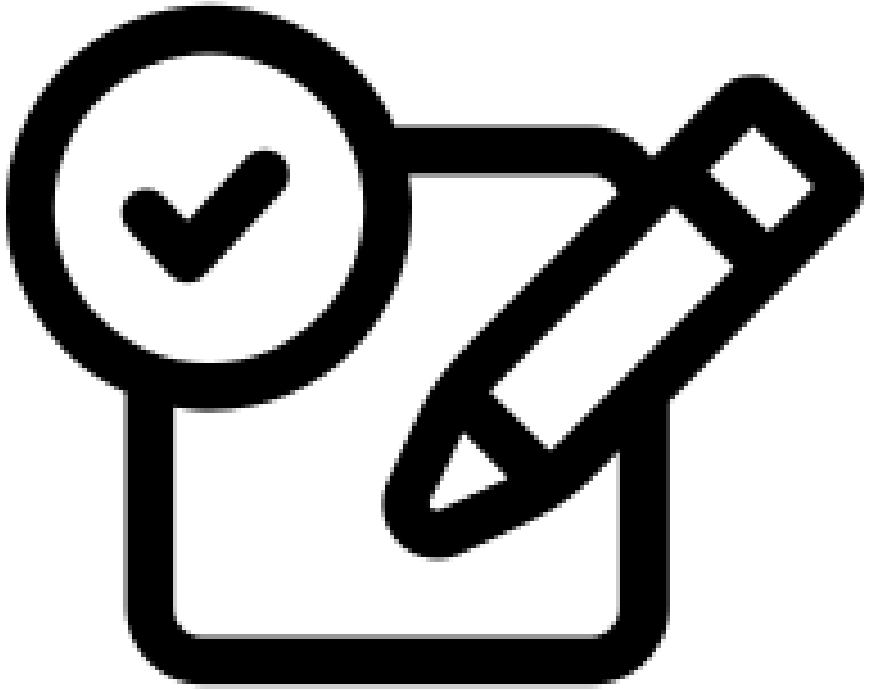
Correct or Incorrect

Instructions

Mode: **In-session**

Duration: **5 minutes**

Materials Required: **None**



Knowledge Check – Correct or Incorrect

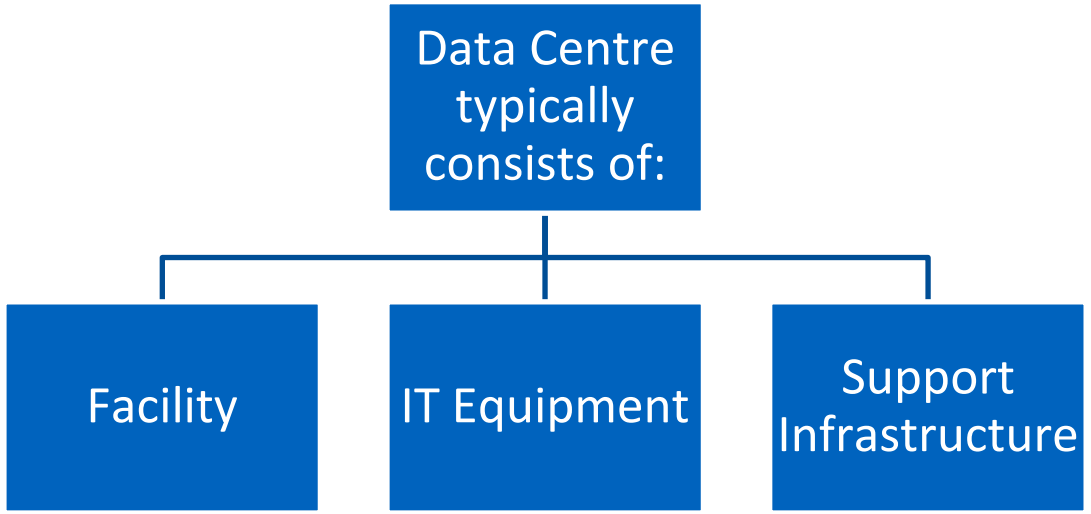
- Data can exist in a variety of forms such as facts stored in a person's mind, photographs and drawings, alphanumeric text and images in a book ✓
- Digital Data is stored as strings of binary values (1s and 2s) on a storage medium that is either internal or external ✗
- Data and Information are the same and can be used interchangeably ✗
- Enterprise resource planning (ERP) is an example of general information system ✗
- Procedures describe how specific data are processed and analyzed in order to get the answers for which the information system is designed ✓
- The purpose of an MIS is improved decision-making, by providing up-to-date, accurate data ✓

What is a Data Centre?

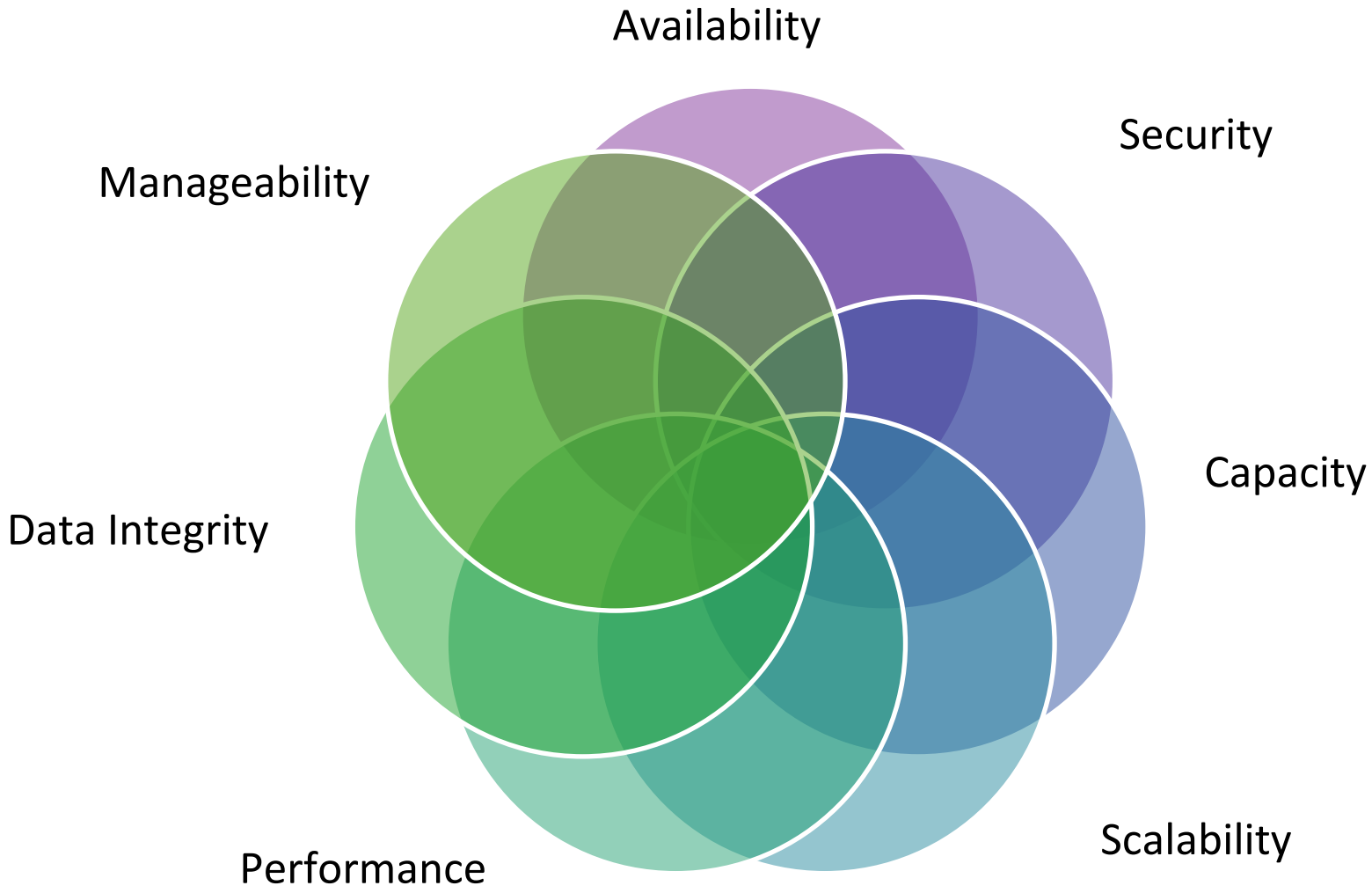
Source: Pixabay

What is a Data Centre?

Source: Pixabay



Characteristics of a Data Centre



Key Data Centre Management Process

Management Process	Description
Monitoring	Continuously gathering information on data centre resources
Reporting	Presenting the details on resource performance, capacity and utilization
Provisioning	Configuring and allocating resources to meet the capacity, availability, performance and security requirements
Planning	Estimating the amount of resources required to support business operations
Maintenance	Ensuring the proper functioning of resources and resolving incidents

Name of the Activity

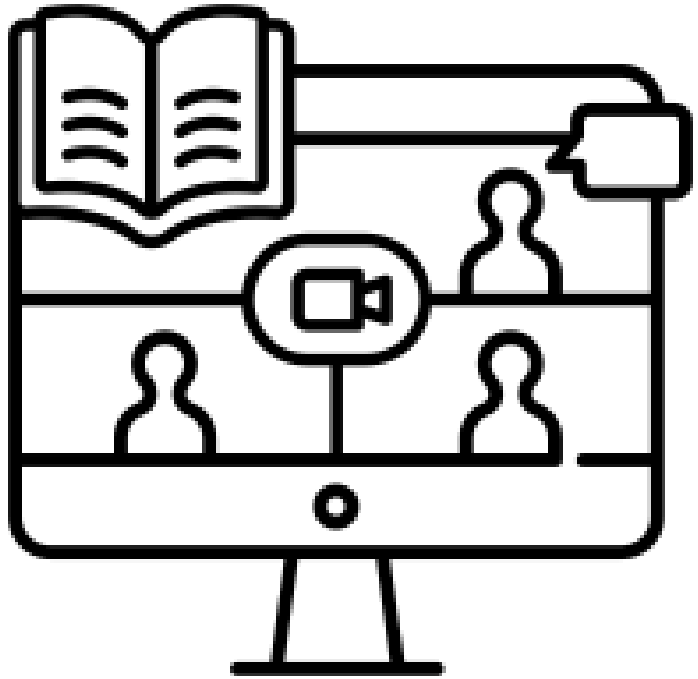
Behind the Door Number

Instructions

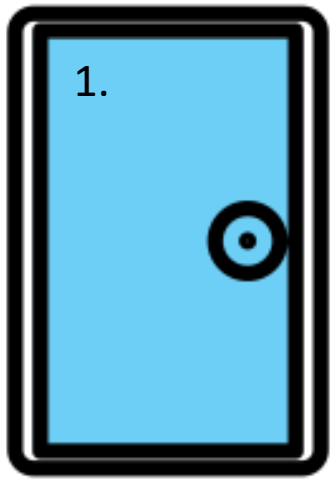
Mode: **In-session**

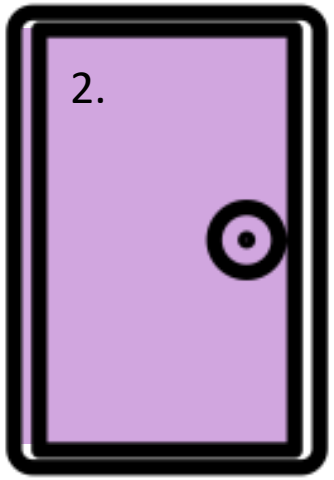
Duration: **5 minutes**

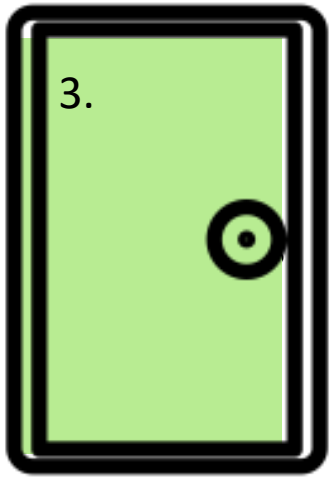
Materials Required: **None**

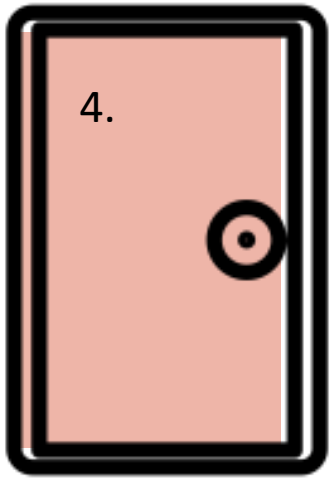


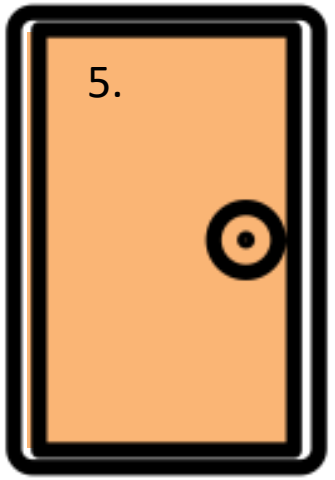
Activity – Behind the Door Number











Source: Noun project

Name of the Activity

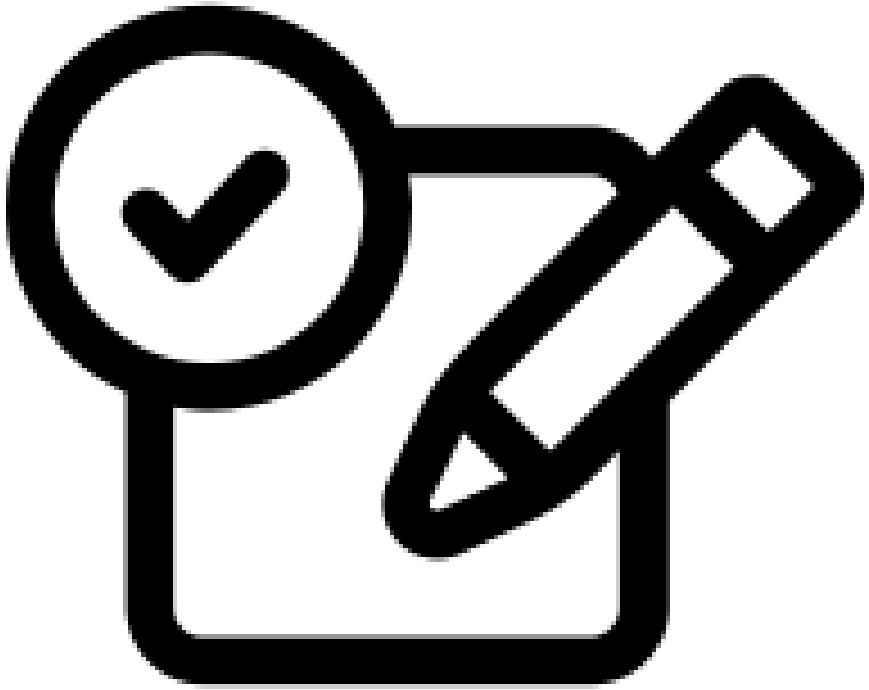
List the characteristics of a Datacentre

Instructions

Mode: **In-session**

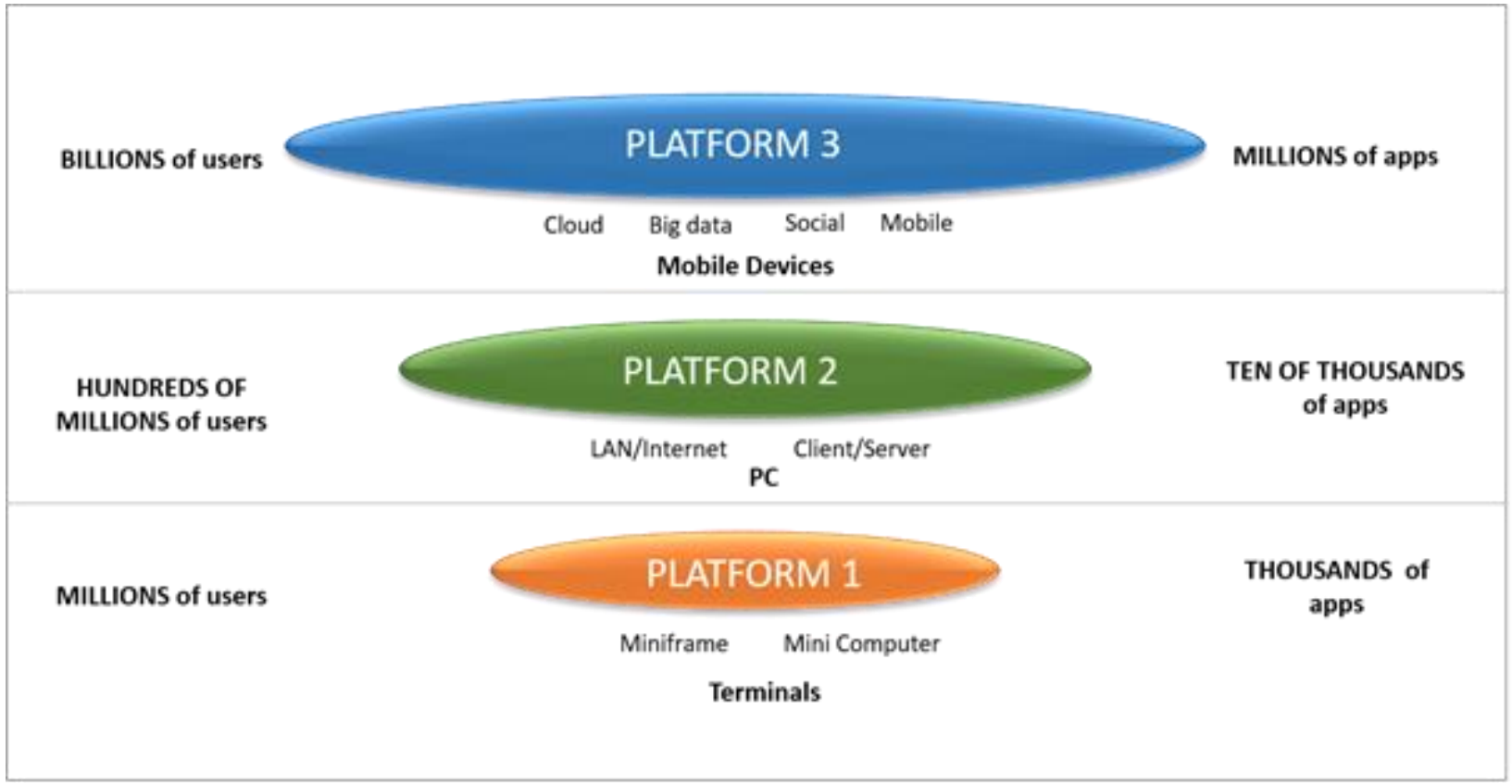
Duration: **5 minutes**

Materials Required: **None**



Evolution of Computing Platforms

- The term “platform” refers to hardware and software that are associated with a particular computing architecture deployed in a data centre.



Name of the Activity

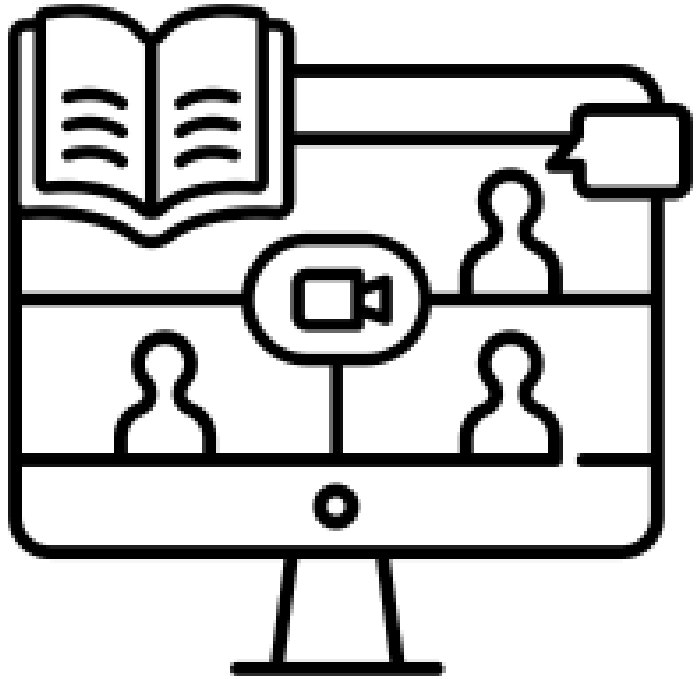
Categorize into the Platforms

Instructions

Mode: **In-session**

Duration: **5 minutes**

Materials Required: **None**



Activity – Categorize into the Platforms

1. Cloud

4. LAN

7. Client Server

2. Miniframes

5. Social Technologies

3. Big Data

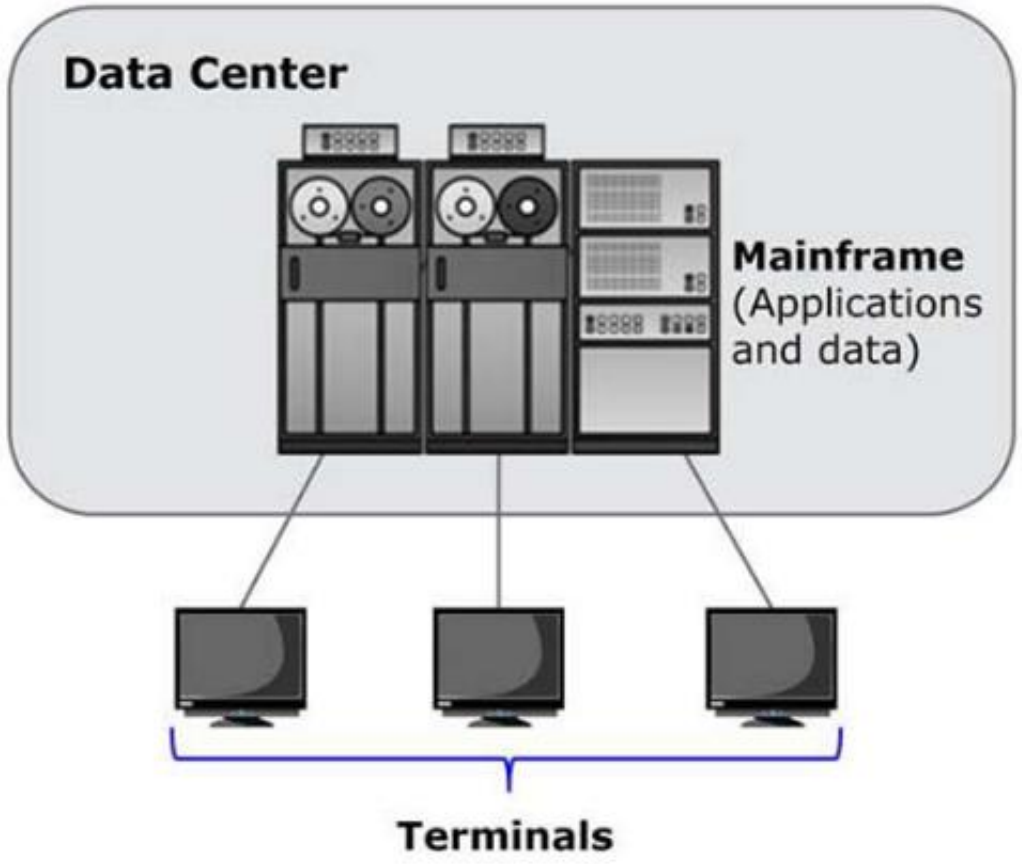
6. Minicomputers

Source: Pixabay

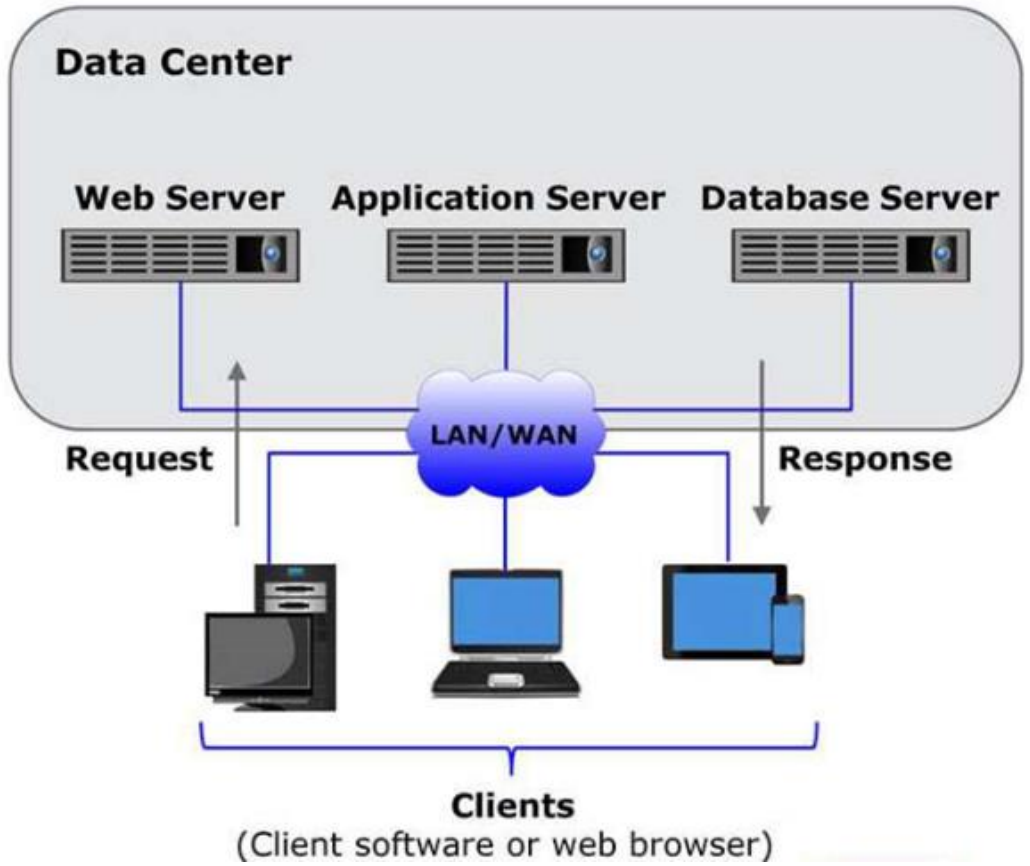
First Platform

- The First Platform is based on mainframes

- Mainframes are compute systems with **very large processing power, memory, and storage capacity** and are primarily used for centrally hosting mission-critical applications and databases in an organization’s data centre



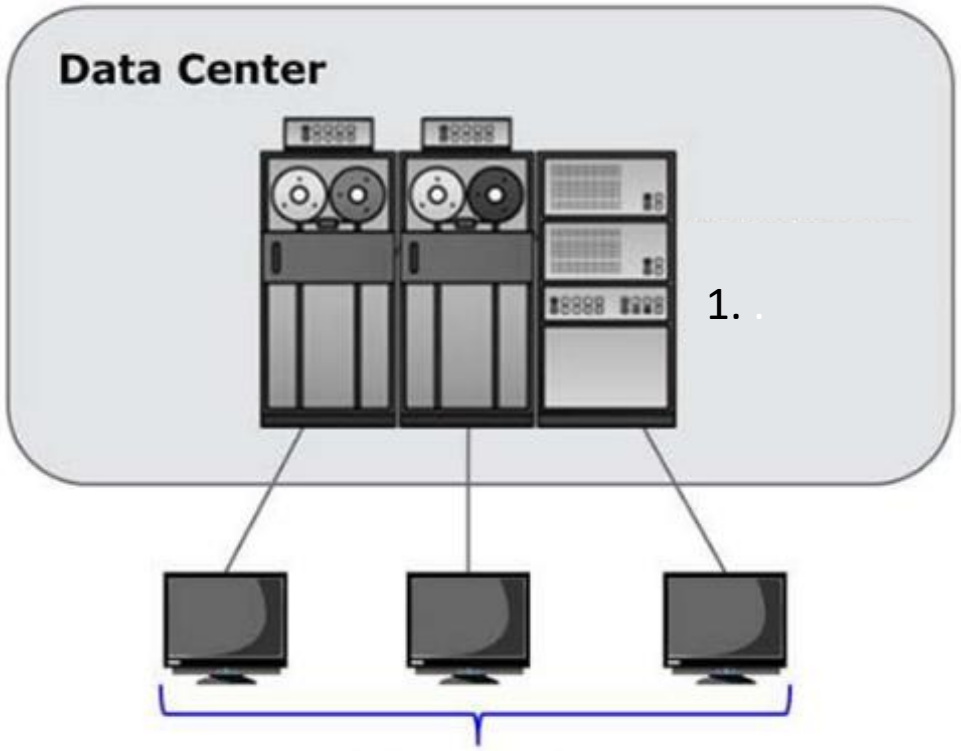
Second Platform

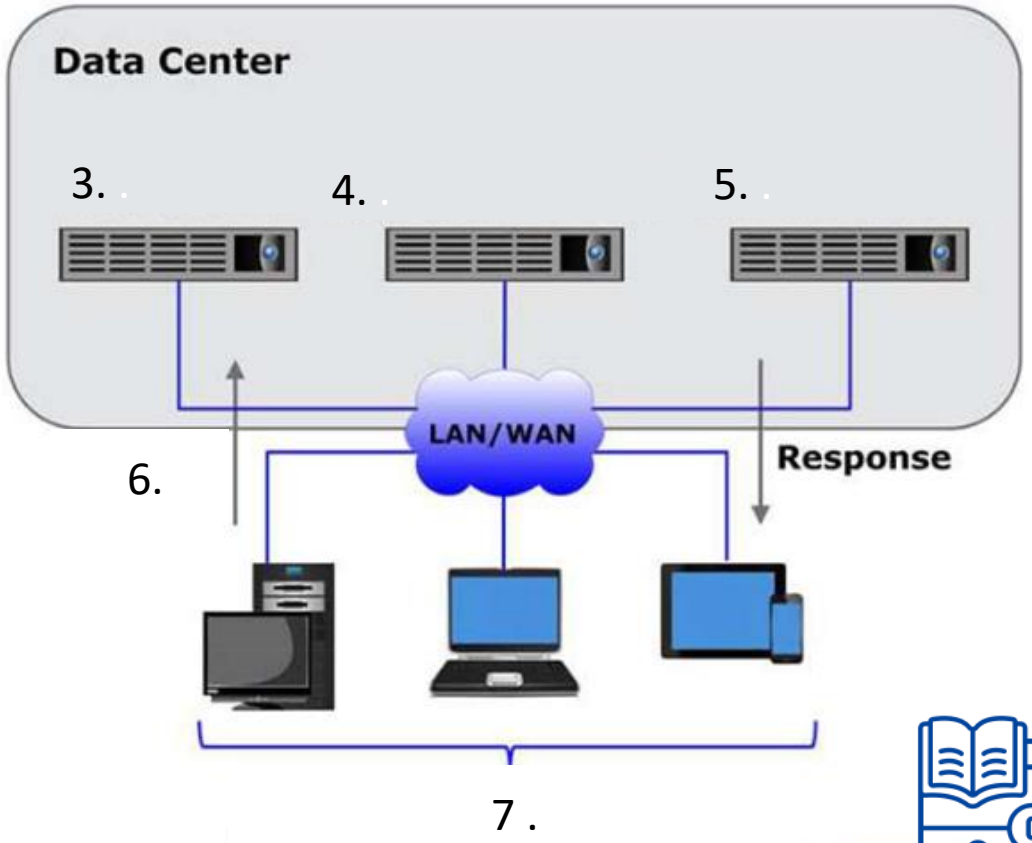


- The client-server model uses a distributed application architecture, in which a compute system called **“server”** runs a program that provides services over a network to other programs running on various end- point devices called “clients”

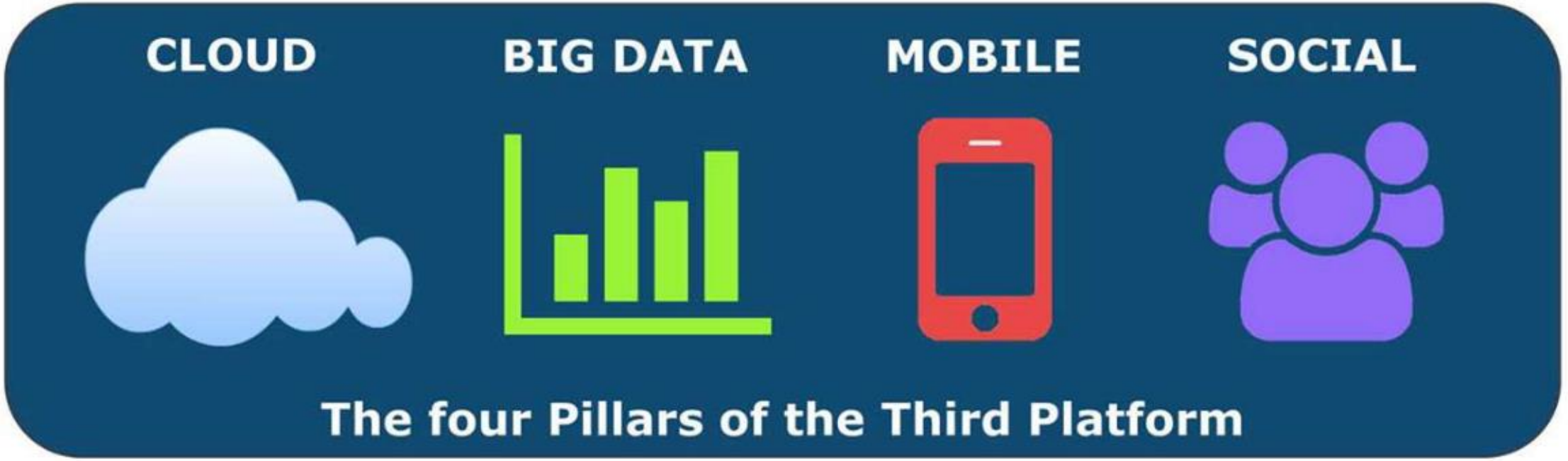
- Both the clients and the servers may have distinct processing tasks that they routinely perform

Activity – Label the Images





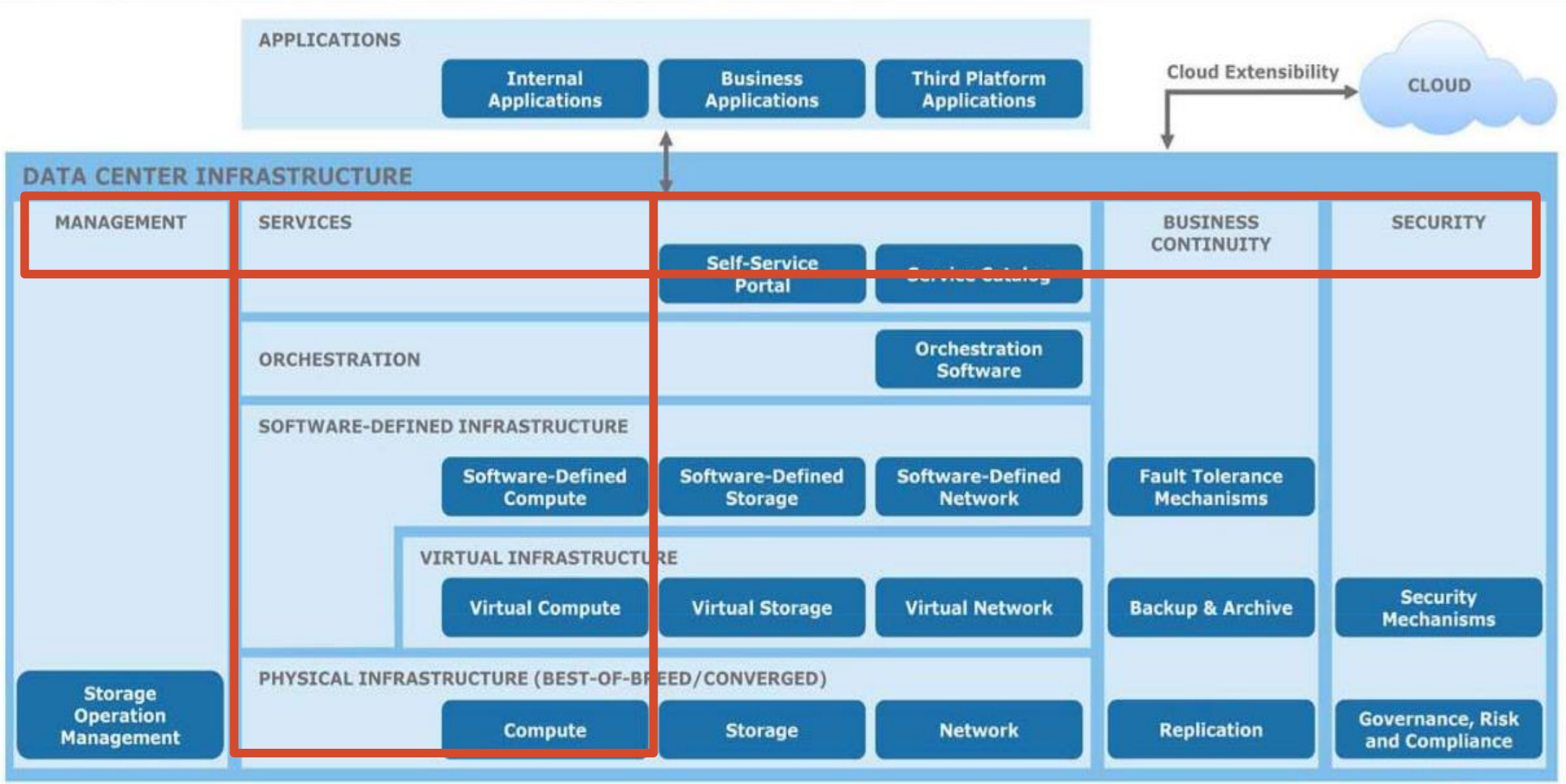
- The third platform is built on a foundation of:



- Third platform technologies are an **enhancement of second platform** technologies rather than a substitution

- A key aspect of third platform is that it is a **convergence of cloud, Big Data, mobile, and social technologies and not just each technology taken in isolation**

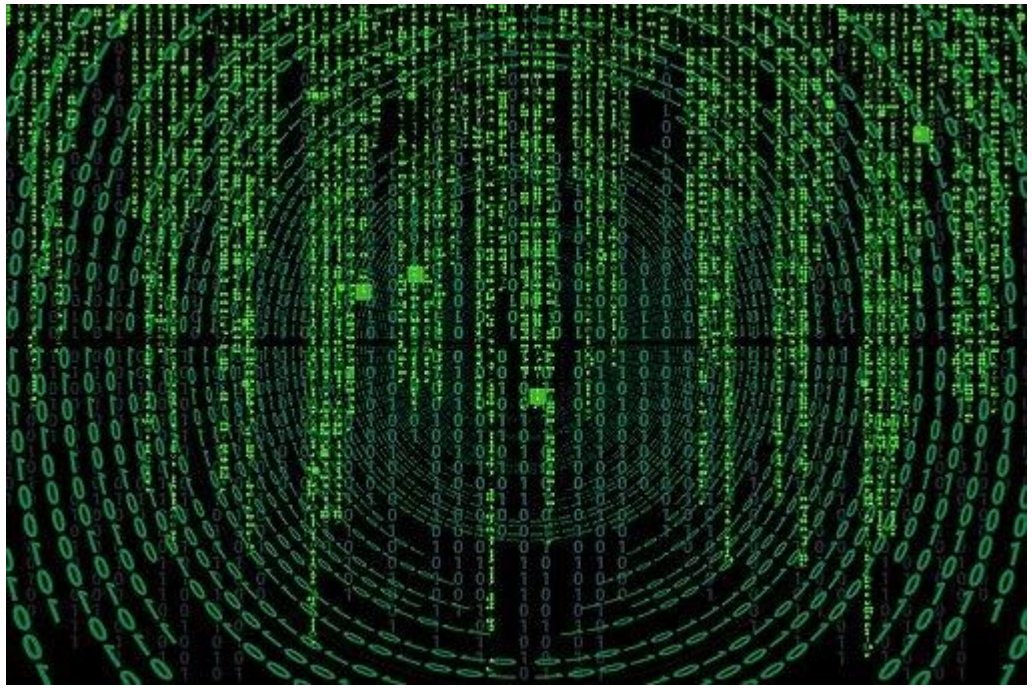
Data Centre Infrastructure



Summary

In this session, you learnt about:

- Digital Data and its types
- Information and Information System
- Data Centres, its Characteristics and Processes
- Evolution of Platforms
- Data Centre Infrastructure



Source: Pixabay